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User's Manual

PCA7408

User's Manual

PROM Programming Adapter for M37221ERSS/EFSP/ESS/M37225ERSS/ECSP/ECSS

Renesas Electronics
www.renesas.com

Rev.1.00 2003.09

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- This product has been developed by assuming its use for program development and evaluation in laboratories. Therefore, it does not fall under the application of Electrical Appliance and Material Safety Law and protection against electromagnetic interference when used in Japan.

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Chapter 1. Precautions for Safety

In both the user's manual and on the product itself, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.

This chapter describes the precautions which should be taken in order to use this product safely and properly. Be sure to read this chapter before using this product.

⚠ **WARNING**	If the requirements shown in the "WARNING" sentences are ignored, the equipment may cause serious personal injury or death.
⚠ **CAUTION**	If the requirements shown in the "CAUTION" sentences are ignored, the equipment may malfunction.
IMPORTANT	It means important information on using this product.

In addition to the three above, the following are also used as appropriate.

△ means WARNING or CAUTION.

Example: ⚠ **CAUTION AGAINST AN ELECTRIC SHOCK**

⃠ means PROHIBITION.

Example: **DISASSEMBLY PROHIBITED**

● means A FORCIBLE ACTION.

Example: **UNPLUG THE POWER CABLE FROM THE RECEPTACLE.**

The following pages describe the symbols "WARNING", "CAUTION", and "IMPORTANT".

⚠ WARNING

Warnings for Use Environment:

- This equipment is to be used in an environment with a maximum ambient temperature of 35˚C. Care should be taken that this temperature is not exceeded.
- Select the proper programming mode of the PROM programmer.

⚠ CAUTION

Cautions to Be Taken for Modifying This Product:

- Do not disassemble or modify this product. Disassembling and modifying the product will void your warranty.

Cautions to Be Taken for This Product:

- Use caution when handling this product. Be careful not to apply a mechanical shock such as falling.
- Do not directly touch the connector pins of this product.
- Be careful with the static electricity when handling this product and the MCU.

Caution for Keeping This Product:

- When not using this product for a long time:
  (1) Attach the connector pins of this product to the conductive sponge.
  (2) Put it into a conductive polyvinyl, and keep it in the package case shipped from the factory.
  (3) Store it in the place where humidity and temperature are low and direct sunshine does not strike.

IMPORTANT

When Using The Product:

- Attach this product to the IC socket on the PROM programmer properly.
- Insert the MCU to the IC socket of this product properly.
- When opening and closing the IC socket of this product, be sure to keep it horizontal.
- Be sure to set the programing area as described in this user's manual.
- Do not use the PROM programmer's device identification code readout function.

Chapter 2. Introduction

This product is a PROM programming adapter for 7200 Series MCUs (8-bit MCU). This product is used to write programs into the internal ROM of MCU with a commercially available PROM programmer.

This manual mainly explains specifications of this product and how to operate it.

Figure 2.1 shows the external view of the product and its constituent parts.

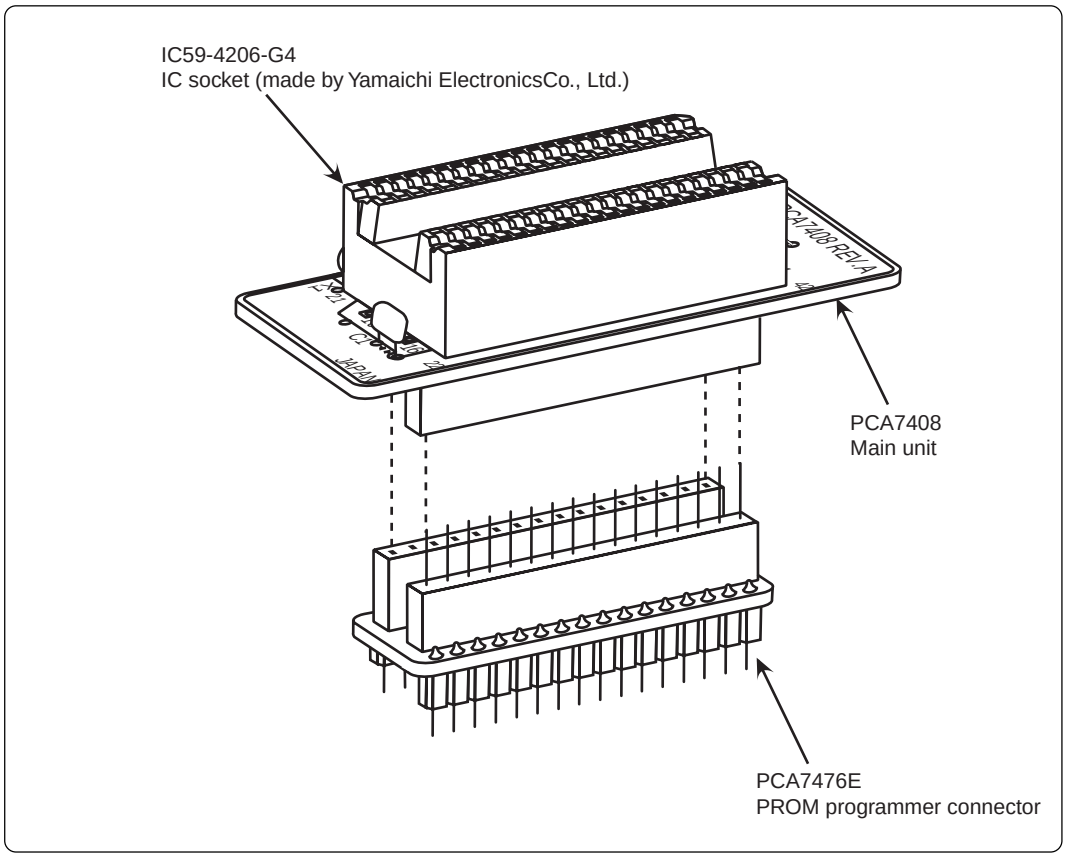


Figure 2.1 External view of the adapter and its constituent parts

2.1 Things to Check When Unpacking

This product consists of the parts listed in Table 2.1. When unpacking, check to see that it contains all of the components.

Table 2.1 Package components

Main unit	PCA7408
Connector	PCA7402E (32-pin)
User's manual	This user's manual

If any part is missing or there is any doubt about your product package, contact your local distributor.

Chapter 3. How to Write the Program

This chapter describes procedures you need to follow to write the program.

For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

3.1 Programming Procedure

Follow the steps (1) to (7) below to write the program into the MCU.

(1) Read the program into the PROM programmer.

▼

(2) Attach the adapter to the IC socket of the PROM programmer. (See Section 3.2)

▼

(3) Insert the MCU into the adapter. (See Section 3.3)

▼

(4) Set the programming area with the PROM programmer. (See Section 3.4)

▼

(5) Check to erase the programming area.*
Using the PROM programmer's erase check function, check whether data can be written into the MCU's programming area.

▼

(6) Write the program into the programming area of the MCU using the PROM programmer.*

▼

(7) Verify the programming area of the MCU using the PROM programmer to check whether the program has been written into the MCU correctly.*

Notes:

* **Be sure to set the programming area. Otherwise the mode's shift to the programming mode may not be performed successfully. The erase check function etc. may not also be performed completely.**
* Some PROM programmers perform the steps (5) through (7) automatically.

3.2 Attaching the Adapter to the PROM Programmer

As shown in Figure 3.1, attach the No. 1 pin of the PCA7402E connector (standard-pitch 32-pin pin-header mounted) to the No. 1 pin of the IC socket of the PROM programmer.

Be careful when attaching to the PROM programmer because incorrect insertion can cause fatal damage to the MCU.

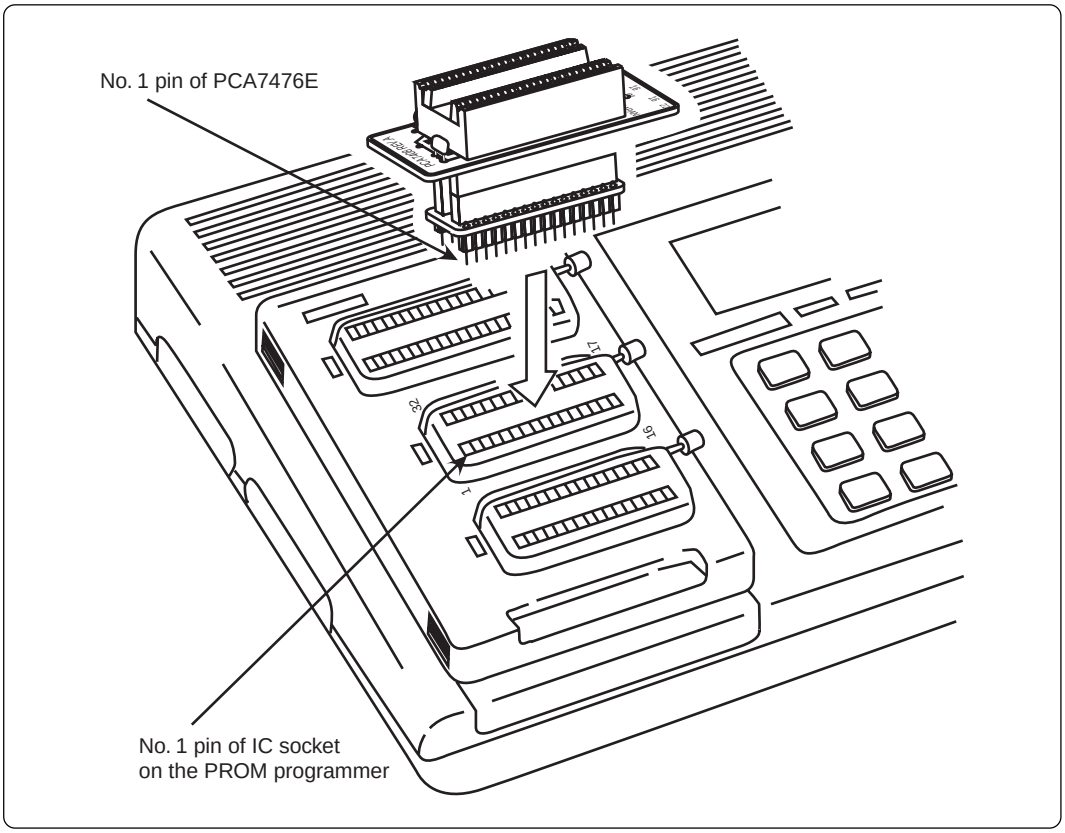


Figure 3.1 Attaching the adapter to the PROM programmer

3.3 Inserting an MCU into the Adapter

As shown in Figure 3.2, insert the MCU into the IC socket with the No. 1 pin of the MCU matched to the No. 1 pin of the IC socket on the PCA7408.

Be careful when attaching to the PROM programmer because incorrect insertion can cause fatal damage to the MCU.

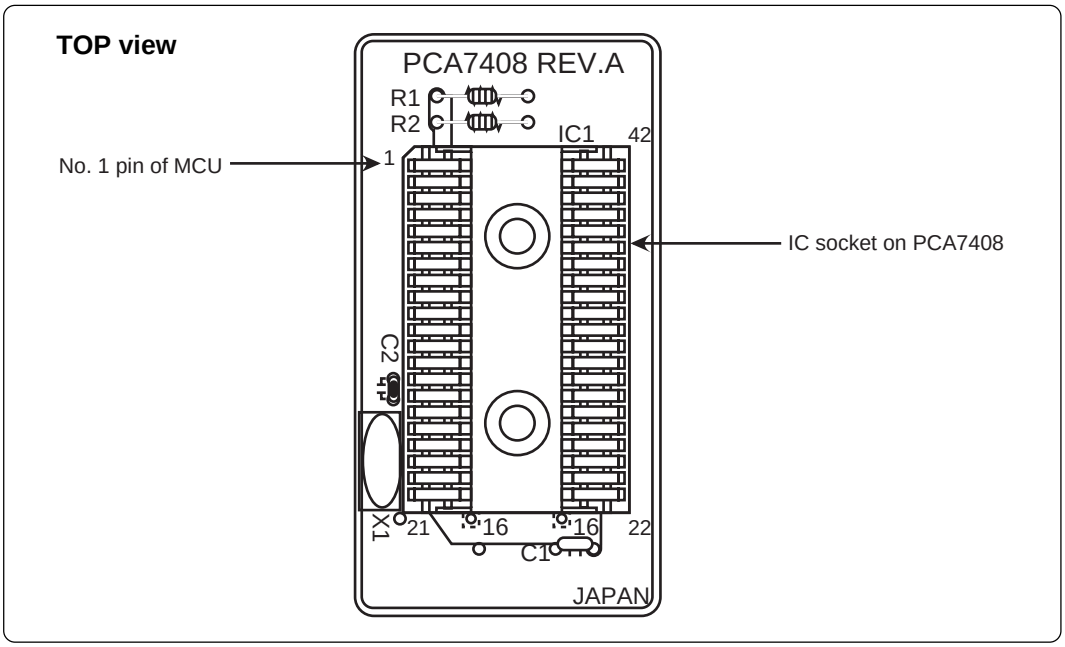


Figure 3.2 Inserting an MCU

⚠ CAUTION

Caution to Be Taken for Handling an MCU:

- Do not touch the connector in the IC socket and the pins on the PROM programmer connector because dirt may cause an electrical insulation failure. When not using this product, attach the connector pins of this product to the conductive sponge as it was shipped from the factory.

3.4 Setting a Programming Area

When writing and erasing programs, be sure to set the programming area. And also, specify its device of the PROM programmer.

Table 3.1 Programming area

MCU type	ROM size	PROM programmer		Programming area of MCU
MCU		Device	Programming area	
M37221EFSP/SS	Internal ROM (62KB)	M5M27C101	00800_{16}-$0FFFF_{16}$	00800_{16}-$0FFFF_{16}$
	OSD ROM (256 types)		10000_{16}-$11FFF_{16}$	10000_{16}-$11FFF_{16}$
M37225ECSP/SS	Internal ROM (48KB)		04000_{16}-$0FFFF_{16}$	04000_{16}-$0FFFF_{16}$
	OSD ROM (15 KB)		11400_{16}-$17AFF_{16}$*	11400_{16}-$17AFF_{16}$*

* These areas include unused area.

⚠ CAUTION

Note on OSD ROM Area:

- For how to write font data into the OSD ROM area, contact your local distributor.

3.5 Recommended PROM Programmers

The PROM programmers listed in Table 5.1 are recommended for this product. Using the actual products, we have verified that these PROM programmers can be used to write programs without problem. Nonconformity occurring by using any other PROM programmers listed in Table 5.1 can not be supported. For how to operate the PROM programmer and the latest type of PROM programmers, contact the manufacturer to confirm whether it can be used for your product.

Table 5.1 Recommended PROM programmers

Manufacturer	Type name	Device name	Programming voltage (Vpp)
Advantest	R4945	M5M27C101 mode	12.5 V
	R4945A		

Chapter 4. Specifications

4.1 Specifications

Table 4.1 lists the common specifications of the programming adapter.

Table 3.1 Specifications

Applicable MCU		M37221ERSS, M37221EFSP, M37221EFSS, M37225ERSS, M37225ECSP, M37225ECSS
IC socket		IC59-4206-G4 (made by Yamaichi Electronics Co., Ltd.)
Operating clock frequency		4 MHz (Supplied by the ceramic oscillator mounted on the PCA7408)
Power supply		Supplied from the Vcc of the PROM programmer
Board configuration	PCA7408	A programmable MCU mounted (IC socket for MCU mounted)
	PCA7402E	Board to be connected to the PROM programmer (for 1M bit mode) (Standard-pitch 32-pin pin-header to be connected to the PROM programmer mounted)

⚠ CAUTION

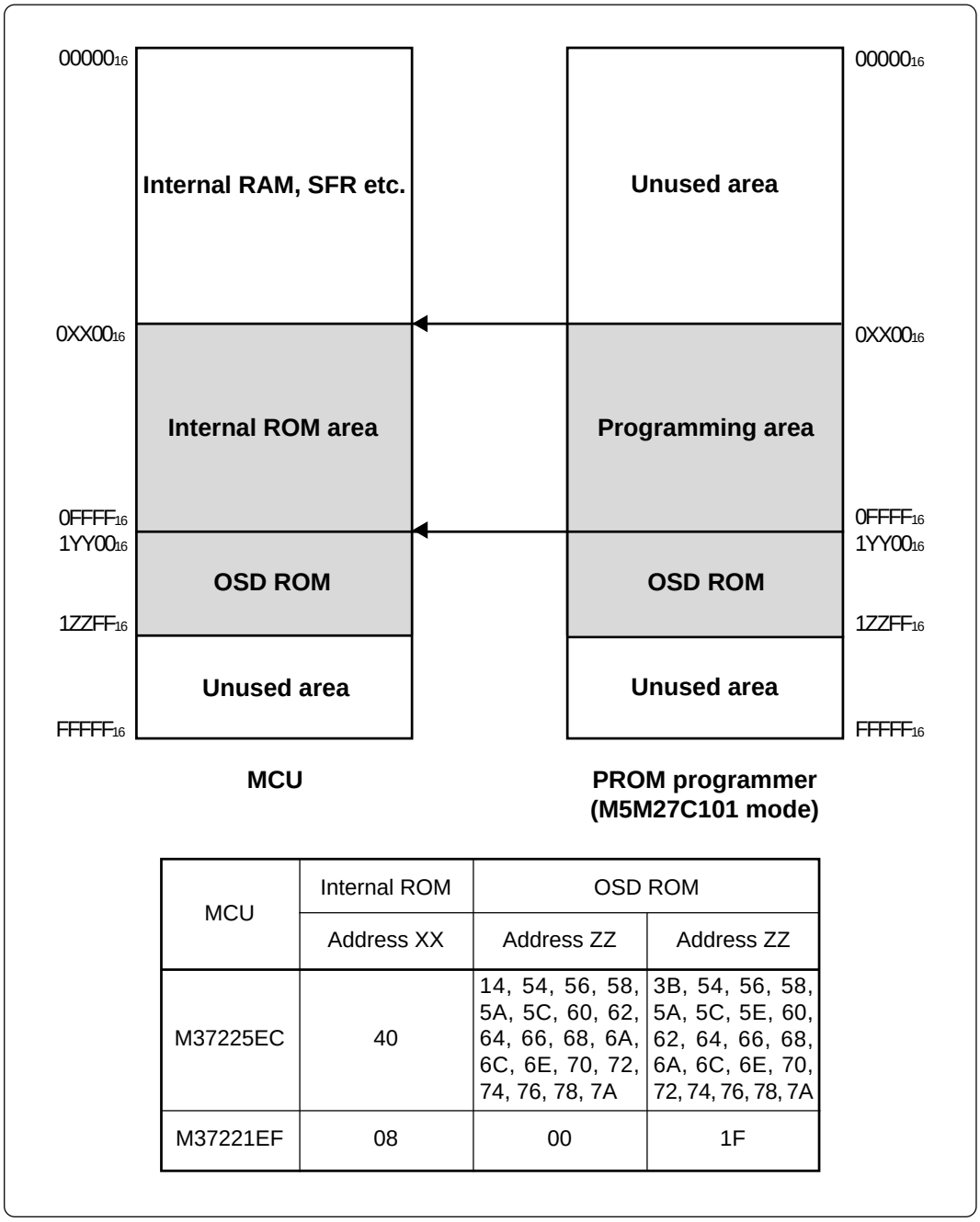
Note on the Latest MCU Information:

- For the latest information about the applicable MCUs, visit Renesas Tools Homepage.

  http://www.renesas.com/jp/tools

4.2 Memory Maps

Figure 4.1 shows memory maps of the MCU and the PROM programmer.



MCU	Internal ROM	OSD ROM	
	Address XX	Address ZZ	Address ZZ
M37225EC	40	14, 54, 56, 58, 5A, 5C, 60, 62, 64, 66, 68, 6A, 6C, 6E, 70, 72, 74, 76, 78, 7A	3B, 54, 56, 58, 5A, 5C, 5E, 60, 62, 64, 66, 68, 6A, 6C, 6E, 70, 72, 74, 76, 78, 7A
M37221EF	08	00	1F

Figure 4.1 Memory maps

Chapter 5. Troubleshooting

The tables below summarizes errors to be checked carefully before you determine them to be a fault.

5.1 Errors That Occur When Writing to PROM

(1) When Newly Purchased

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	8
	Is the MCU attached to the correct position?	9
PROM programmer	Is the area set correctly?	10
	Is the correct device selected?	10
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-

(2) Previously Written Normally

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	9
	Is the MCU attached to the correct position?	9
PROM programmer	Is the area set correctly?	10
	Is the correct device selected?	10
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-
	The PROM programmer connector at which the PROM programmer is contacted may be stained. Clean it with alcohol, etc.	-

5.2 MCUs Do Not Function Normally

The program operates normally on the emulator, but when the MCU that has normally been written is attached the same program does not function normally.

(1) Is the offset address specified correctly when copying data into the PROM programmer?

(2) In the emulator, NOPs are often inserted in the area where the program has not been read, therefore the program happens to appear functioning normally even though it may have gone wild. Check your program again.

(3) The emulator and the actual MCU may differ in characteristics. Consult the user's manual of the emulation pod to check for differences in characteristics again.

5.3 Other Precautions

(1) About the Recommended PROM Programmers

Not all PROM programmers available on the market can be checked to see if they function properly. There are several PROM programmers that we have verified to function properly. These products are listed as recommended PROM programmers in this user's manual. Other PROM programmers may also be used providing that you verified them to function properly.

Note: No matter which type of PROM programmer you use, it is necessary to verify completion of programming by executing screening, etc. that are stipulated for each MCU used.

(2) About Reading Out of Device Identification Code*[1]

Please do not use the PROM programmer's device identification code readout function.

Using this function may break down the MCU. The device identification code is included in EPROM to indicate the manufacturer code and device code; it is not included in the MCU.

*[1] Depending on PROM programmer manufacturers, this may be referred to by another name (e.g. ID code).

5.4 How to Request for Support

After checking this manual, fill in the following information and email to your local distributor.

For prompt response, please specify the following information:

(1) Contact address

- Company name
- Department
- Responsible person
- Phone number
- Fax number
- E-mail address

(2) Product information

- Name of the programming adapter
- Serial number
- Date of purchase
- Target MCU
- Symptoms (Fails blank check/Cannot write a program/Fails verification etc.)
- Detailed symptoms
- How often does the problem occur? (2 out of 10 etc.)
- When did the problem start to occur? (Since purchase/Used to work correctly)
- Type name of the PROM programmer (Advantest R4945A etc.)
- Specified device when writing to PROM (M27C101 etc.)
- Specified programming area when writing to PROM
- Switch settings of the adapter when writing to PROM

PCA7408 User's Manual

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PCA7408
User's Manual

Renesas Electronics Corporation
1753, Shimonumabe, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8668 Japan

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